



Air Force Research Laboratory|AFRL

Science and Technology for Tomorrow's Air and Space Force



Success Story

AFRL OPENS DISTRIBUTED HETEROGENEOUS SIMULATION LABORATORY



AFRL opened the Distributed Heterogeneous Simulation (DHS) Laboratory to enable faster and more detailed simulation of large-scale dynamic systems. The DHS Laboratory takes advantage of advanced techniques developed with industry partner PC Krause and Associates under Air Force (AF) Small Business Innovation Research Phase I and II projects. Essentially, the DHS Laboratory's various computer interconnections provide an inexpensive, high-speed computational capability that enhances the design, operation, and security of large-scale dynamic systems.



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Accomplishment

Researchers use the DHS Laboratory to simulate and analyze numerous systems of interest to the AF. This research supports the integration of propulsion, power, thermal, avionics, sensor, and directed energy weapon subsystems at an unsurpassed level of detail. For example, Global Hawk program researchers plan to investigate integrated propulsion, power, and electrical load dynamic performance, including advanced sensor suites such as the Multiplatform Radar Technology Insertion Program for expanded available payload during high-altitude flight.

In addition, researchers supporting the F-35 Joint Strike Fighter program are using the facility to integrate proprietary contractor models written in different languages, allowing them to investigate and mitigate adverse component interactions. The DHS Laboratory also supports efforts such as the F-16 Integrated Cooling and Power System, Airborne Active Denial, High-Altitude Airship, and Supersonic Combustion Ramjet programs.

Background

Complex systems, including commercial/military aircraft, unmanned air vehicles, ships, land vehicles, and advanced weapons systems, involve a broad spectrum of technologies and interactive subsystems that must interact synergistically to achieve mission goals. Thus, the design of these complex, large-scale systems requires collaboration among geographically dispersed groups and design teams based within private companies, government laboratories, and/or universities. The focus of these groups is often limited to specific subsystems or areas of expertise; however, the interdependencies existing between these subsystems increase the importance of establishing detailed, end-to-end system simulations for the design, analysis, and optimization of complex, large-scale systems.

Propulsion
Emerging Technologies

Additional Information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (05-PR-06)